4 CRUDE MAJOR EWO NO. :	BE139-E1	REV: 0
PLANT: 4 CRUDE	SAP COST CENTER:	DD173-EXP
W/O # 332030-001	PROJECT / OUTAGE #:	SDD108A

V-1100 LEVEL BRIDLE PIPING REPLACEMENT

MOC #:

Level 1 - Management of Change Review

Will This Change:

- ☐ Cause the use of different feeds, chemicals, or catalysts?
- ☐ Cause the use of different process conditions, instrumentation, process control, or affect upstream/downstream plants?
- ☐ Cause the use of new or modified equipment (which is other than in-kind)?
- ☐ Alter equipment siting, building, trailer locations, roads, or fire protection?
- ☐ Require modifying existing and/or developing new procedures?
- ☐ Affect employee emergency response due to an organizational change?
- ☐ Transfer the responsibility for any environmental, health, or safety-related task?
- ☐ Alter the permanent staffing level or organization of any safety-sensitive job?

SAFETY OPERATOR	IN VOC SERVICE?	IN PLANT WELDING?
☒ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☒ No

APPROVALS

OPERATIONS :	K. Sohnrey	DATE: 6/7/11	PHONE: 2-2042
ENGINEERING :	P. Murphy	DATE: 6/7/11	PHONE: 2-1864
IMPACT. T.L :	M. Greenfield	DATE: 6/7/11	PHONE: 2-1179
MAINTENANCE:	V. Massaro	DATE: 6/7/11	PHONE: 2-5995

R. RAMIREZ
JUN 07 2011

Engineering Work Order - EWO

5/31/2011 7:38:40 AM

EWO #:	5996	**Revision:**	0	**Created On:**	4/26/2011
Originator:	Hohmann, Mark D.	**ABU:**	D&R	**Plant:**	4 Crude
MOC#:		**Section Two Reviewer:**	Preciado, Silvano E.	**Equipment #:**	V-1100
Passport W/O:	332030	**Project Number:**	DD173-EXP	**EWO Type:**	Shutdown
Item:		**SAP Cost Center:**		**Status:**	Approved
S/D EWO #:	BE-139-E1				

☑ FullVersion ☐ SupplementalVersion

Title: V-1100 Level Bridle Piping Replacement

Scope: Replace approximately 10 linear ft of 2" level bridle piping off of the V-1100 main vessel body (pipe class 1CS23). This replacement also includes the ¾" and 1" pipe branches for the following level instruments: LSL-011, LSH-011, LG-001, and LG. These instruments are to be reused.

This piping is being replaced because there were three valves identified on the Operations Extra Valve List (valves XVLV-075, XVLV-076, and XVLV-078) that are on this bridle. Replacing all of the bridle piping will be more cost effective than only replacing the valves as it will minimize field work during the turnaround.

☐ **Cause the use of different feeds, chemicals, or catalyst**

☐ **Cause the use of different process conditions, instrumentation, process control, or affect upstream/downstream plants?**

☐ **Cause the use of new or modified equipment (which is other than in-ki**

☐ **Alter equipment siting, building, trailer locations, roads, or fire protecti**

☐ **Require modifying existing and/or developing new procedur**

Technical Basis For Change

Safety Operator Required? Yes **In VOC Service?** Yes **In Plant Welding?** No

Approvers Section

	Person Responsible	Notified O	Completed B	Completed O
Lead Engineer:	Murphy, Patrick K.	5/12/2011	Murphy, Patrick K.	5/16/2011
Maintenance:	Massaro, Vincent R.	5/16/2011	Massaro, Vincent R.	5/16/2011
Building Permit:	Linares, Elena E.	5/16/2011	Linares, Elena E.	5/25/2011
Inspection:				
Operations:	Sohnrey, Kenneth C.	5/16/2011	Sohnrey, Kenneth C.	5/16/2011

1.0 SCOPE

Replace approximately 10 linear ft of 2" level bridle piping off of the V-1100 main vessel body (pipe class 1CS23). This replacement also includes the ¾" and 1" pipe branches for the following level instruments: LSL-011, LSH-011, LG-001, and LG. These instruments are to be reused.

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2.0 GENERAL REQUIREMENTS

All work in this EWO shall be in strict compliance with the following ASME Codes and Richmond Refinery standards:

- ASME B31.3 (latest):_____Process Piping
- ASME Section IX (latest):_____Welding and Brazing Qualifications
- ASME Section V (latest):_____Nondestructive Examination
- All piping work in this EWO shall be in compliance with the "Richmond Refinery Weld Inspection Requirements for Piping Fabrication". The piping Contractor is responsible for complying with these quality assurance procedures.
- Any repair alternatives to the instructions in this EWO shall be reviewed and approved by a Chevron Designs Engineer.

3.0 MATERIAL

- Obtain valves from **MR #184568** under **Maximo#: 332030**
- All other materials to be supplied by Maintenance and/or the Contractor on **Maximo #: 332030.**

4.0 WORK DESCRIPTIONS

4.1 Questions? Call Pat Murphy at 2-1864 or another local Shutdown Design Engineer.

Pre-Shutdown Work

4.2 Pre-Fabricate New Piping Spools

4.2.1 Piping Location is shown on drawings SK-5996-1 and SK-5996-2

4.2.2 Fabricate new in-kind replacement spools per drawing SK-5996-3.

- Field Verify All Pipe and Valve Sizes and Dimensions
- Field Verify All Valve Handwheel Angles
- Pipe Class: **1CS23**
- Weld Procedures: **CVX-101, CVX-104, CVX-107, CVX-102, CVX-105, CVX-108**
- Hydrostatic Test Pressure: **450 psig**

4.2.3 Coat piping per Chevron Coating System Data Sheet **3.1 – Desert Sand Color**

Shutdown Work

4.3 Demo pipe per drawing SK-5996-1 thru -3.

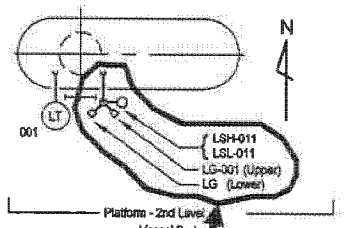
- Save All Instruments for Re-Use: LG-001, LG, LSL-011, LSH-011
- Piping Location is shown on drawings SK-5996-1 and SK-5996-2

4.4 Install New Pre-Fabricated Pipe Spools.

4.5 Reinstall all previously saved instruments.

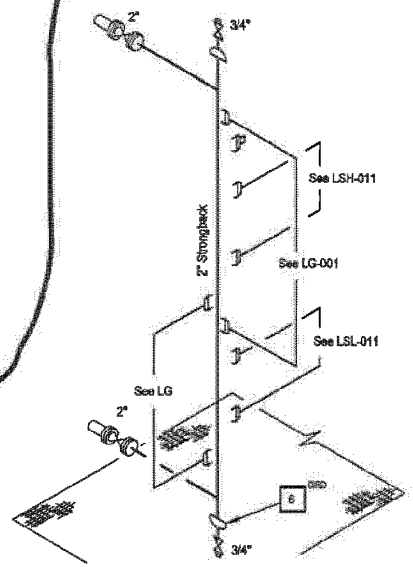
5.0 ATTACHMENTS

- **SK-5996-1**: ISO 0955-003-012 _____ 1 Sheet
- **SK-5996-2**: P&ID D-308314 _____ 1 Sheet
- **SK-5996-3**: Level Bridle Replacement Spool _____ 1 Sheet
- **D-308314:** P&ID Updates _____ 1 Sheet
- **Piping Classification**: 1CS23 _____ 3 Sheets
- **Chevron Coating System**: 3.1 _____ 1 Sheet
- **Welding Procedure**:CVX-101, 104, 107, 102, 105, 108__See Maintenance Personnel

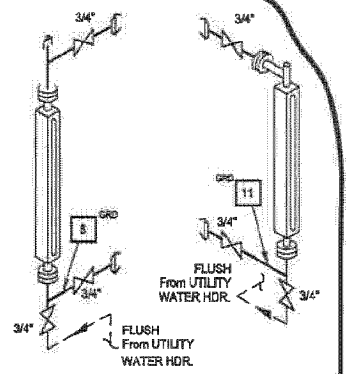


V-1100
ATMOSPHERIC COLUMN REFLUX DRUM
ORIENTATION PLAN
(D-305314)

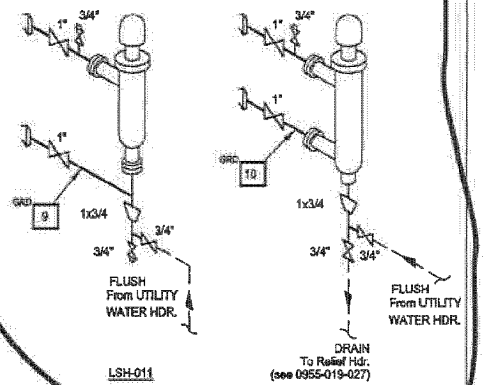
- **REPLACE LEVEL BRIDLE PIPING PER SK-5996-3.**
- **SAVE & RE-USE ALL LEVEL INSTRUMENTS.**



LSH-011/LSL-011/LG-001/LG
Platform - 2nd Level
Vessel Body



LG-001 LG



LSH-011 LSL-011

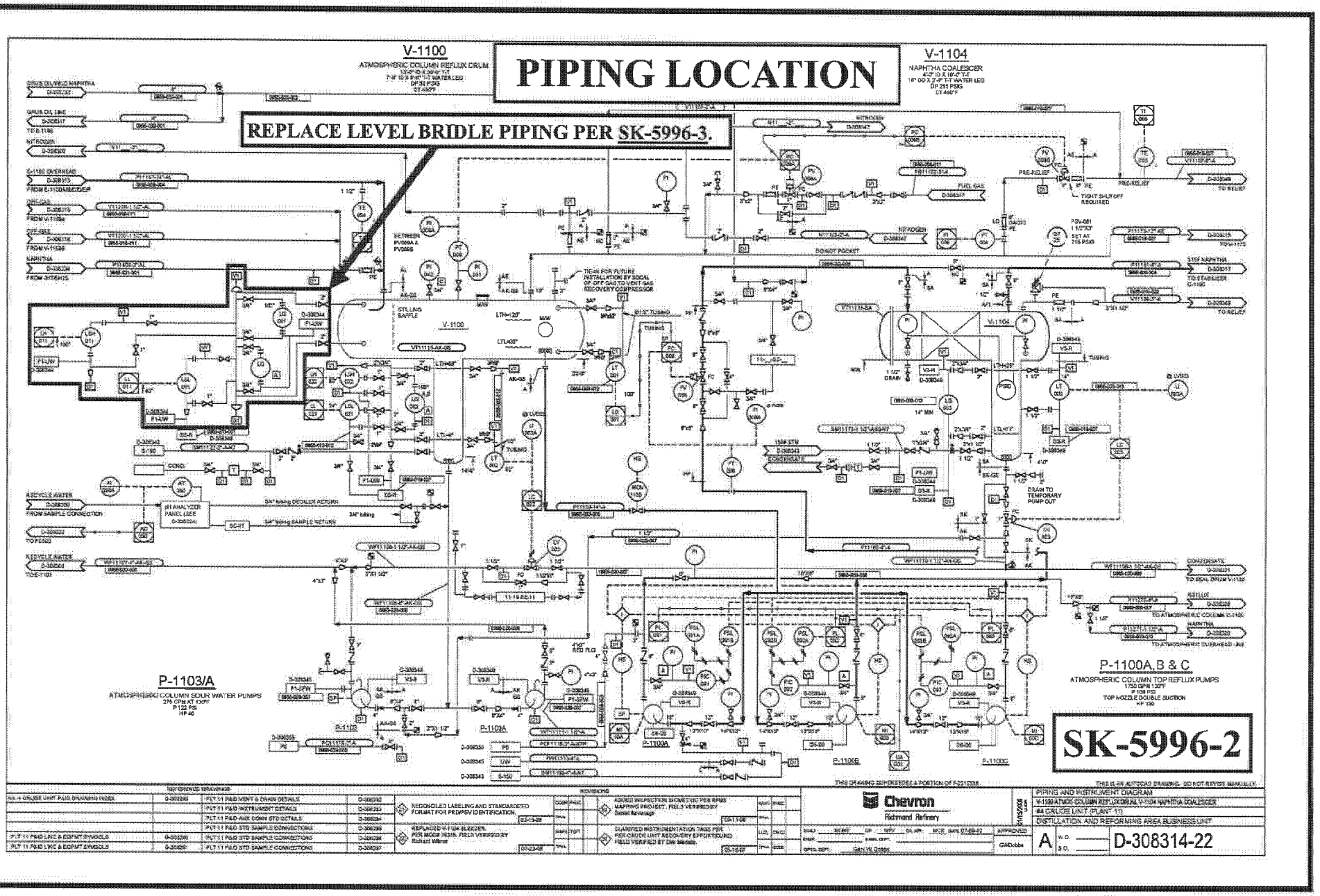
PIPING LOCATION

SK-5996-1

V-1100 INSTRUMENTS

STATUS: ISO570 COMPLETE		RATING?	API-570	02/13/2010 TTMW	INSPECTION PIPING ISOMETRIC
MATERIAL: C.S.	SERVICE: NAPHTHA	X 150# ☐ 300#	☐ CLASS I		#3 ATMOSPHERIC COLUMN OVERHEAD
PIPE CLASS: *AB4*(AK)	PWHT: NO	STM TRACED? ☐	X CLASS II		#4 CRUDE UNIT (PLANT 11)
		INSULATED? ☐	☐ CLASS III		DISTILLATION AND REFORMING AREA BUSINESS UNIT
LINE NAME: V-1100 INSTRUMENTS				Z	0955-003-012 REV 4 SHT 1
FROM:					
TO:					

REVISION			
2	1Q2002 D&R PLANT#11 S/D "As Built" per MOC# 10129	KAVD	POST
	5/29/02	TPVA	



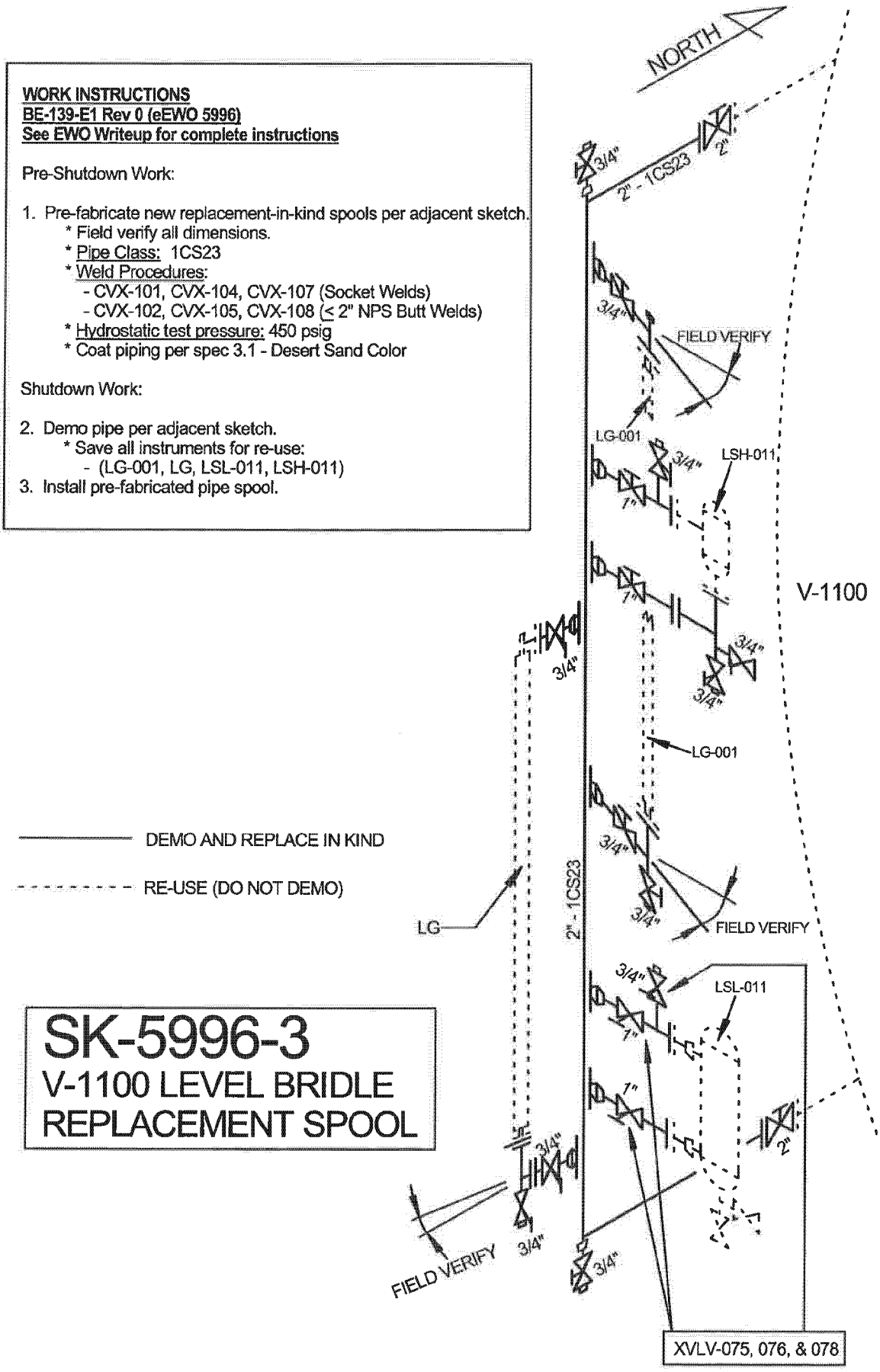
WORK INSTRUCTIONS
BE-139-E1 Rev 0 (eEWO 5996)
See EWO Writeup for complete instructions

Pre-Shutdown Work:

1. Pre-fabricate new replacement-in-kind spools per adjacent sketch.
   * Field verify all dimensions.
   * Pipe Class: 1CS23
   * Weld Procedures:
     - CVX-101, CVX-104, CVX-107 (Socket Welds)
     - CVX-102, CVX-105, CVX-108 (≤ 2" NPS Butt Welds)
   * Hydrostatic test pressure: 450 psig
   * Coat piping per spec 3.1 - Desert Sand Color

Shutdown Work:

2. Demo pipe per adjacent sketch.
   * Save all instruments for re-use:
     - (LG-001, LG, LSL-011, LSH-011)
3. Install pre-fabricated pipe spool.



SK-5996-3
V-1100 LEVEL BRIDLE REPLACEMENT SPOOL

		LIMITED BY:	Flanges
SERVICE:	Process (NACE)	MATERIAL:	Carbon Steel
RATING CLASS:	150 RF, ASME B16.5-2009	DESIGN CODE:	ASME B31.3-2008
TEMPERATURE LIMIT:	-20F to 450F	STRESS RELIEF:	NONE
NOMINAL CORROSION ALLOWANCE:	0.125 in. (0.092 in. MIN)	EXAMINATION:	5% RT, PT & Visual
VALVE TRIM:	API Trim #12 (316SS & HF)		

PRESSURE - TEMPERATURE RATINGS			NOTE: HYDROTEST @ AMBIENT = 450 psig		
TEMP F	-20 to 100	200	300	400	450
psig	285	260	230	200	185
TEMP C	-29 to 38	93	149	204	232
kPag	1965	1795	1585	1380	1275

For NPS 3/4 through NPS 30 (Full flange ratings per ASME B16.5 and ASME B16.47, Tables 2-1.1.)

ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION	ITEM CODE
PIPE		3/4 – 1-1/2	160	PE	CS, SMLS, ASTM A106-B	L11LA1B
		2 – 2	XS/80	BE	CS, SMLS , ASTM A106-B	L11NA2A
		3 – 24	STD	BE	CS, SMLS , ASTM A106-B	L11MA2A
		26 – 28	STD	BE	CS, SMLS/DSAW, API-5L PSL2 (Ej=.95)	L14MA2A
		30 – 42	XS	BE	CS, SMLS/DSAW, API-5L PSL2 (Ej=.95)	L14NA2A
NIPPLES Branch		3/4 – 1-1/2	160	PE	CS, SMLS , ASTM A106-B	L34LAEJ
Branch		3/4 – 1-1/2	XXS	TOE-POE	CS, SMLS , ASTM A106-B	L34PAHJ
Swage (CONC)		3/4 – 1-1/2	160	BBE	CS, ASTM A234-WPB-S, MSS SP-95	L55LA1VA
Swage (CONC)		3/4 – 1-1/2	XXS	BLE-TSE	CS, ASTM A234-WPB-S, MSS SP-95	L35PBMQ
FITTINGS Sockolet		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, MSS SP-97	L36VBDT
Thredolet	03	3/4 – 1-1/2	Class 6000	THRD	CS, ASTM A105, MSS SP-97	L36VBAT
SW Elbolet		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105	L36VBDU
Latrolet	92	3/4 – 1-1/2	160	Weld	CS, ASTM A105	L56LA1K
Weldolet	05	3/4 – 1-1/2	160	Weld	CS, ASTM A105, MSS SP-97	L56LA1H
90 ELL		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L30VBDB
45 ELL		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L30VBDA
Tee	03	3/4 – 1-1/2	Class 6000	THRD	CS, ASTM A105, ASME B16.11	L31VBA
Tee		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L31VBD
Tee (RED)		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L31VBDD
Plug	03	3/4 – 1-1/2		THRD	CS, ASTM A105, round head, ASME B16.11	L370ABW
Plug		3/4 – 1-1/2		PE	CS, ASTM A105, round head, ASME B16.11	L370AEW
Coupling		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L34VBDH
Cap		3/4 – 1-1/2	Class 6000	SW	CS, ASTM A105, ASME B16.11	L37VBDX
Reducer (CONC)		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DA
Reducer (ECC)		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DB
Weldolet	05	2 – 2	XS/80	Weld	CS, ASTM A105, MSS SP-97	L56NA1H
90 LR ELL		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1BC
45 LR ELL		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1AC
Tee		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1
Tee (RED)	99	2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1D
Cap		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57NA1R
Reducer (CONC)		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55MA1DA
Reducer (ECC)		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55MA1DB
Weldolet	05	3 – 8	STD	Weld	CS, ASTM A105, MSS SP-97	L56MA1H
90 LR ELL		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50MA1BC
45 LR ELL		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50MA1AC
Tee		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51MA1
Tee (RED)	99	3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51MA1D
Cap		3 – 28	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57MA1R
Reducer (CONC)		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DA
Reducer (ECC)		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DB
90 LR ELL		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1BC
45 LR ELL		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1AC
Tee		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1
Tee (RED)	99	30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1D
Cap		30 – 42	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57NA1R

ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION	ITEM CODE
VALVES						
Gate	15	3/4 – 1-1/2	Class 150	RF	CS body, API #12 trim, RP, BB, NACE	L20BA3HT9
Gate		1/2 – 1/2	Class 800	MSW/FSW	CS body, API #12 trim, RP, BB, EXTD BDY, NACE	L20KAXHTM9
Gate	02	3/4 – 1-1/2	Class 800	MSW/FNPT	CS body, API #12 trim, RP, BB, EXTD BDY, NACE	L20KAYHTM9
Gate		3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim, RP, BB, NACE	L20KA1HT9
Gate	325	3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim, FP, BB, NACE	L20KA1DT9
Gate	06	3/4 – 1-1/2	Class 800	T/SW	CS body, API #12 trim, RP, BB, NACE	L20KA7HT9
Gate	309	3/4 – 1-1/2	Class 800	T/SW	CS body, API #12 trim,RP,BELLOW SL,WB, NACE	L20KA7MTL9
Gate	309	3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim,RP,BELLOW SL,WB, NACE	L20KA1MTL9
Gate		2 - 8	Class 150	RF	CS body, API #12 trim, BB, FP, NACE	L20BA3CT9
Gate		10 – 24	Class 150	RF	CS body, API #12 trim, BB, FP, GO, NACE	L20BA3CTF9
Knife Gate	329	14 – 24	Class 150	RF	CS body, 316SS trim, Aflas Seals, GO, NACE	L20BA3UTF9
Knife Gate	329	26 – 42	Class 150	RF	CS body, 316SS trim, Aflas,B16.47"B",GO, NACE	L20BA3UTFZ9
Globe	307	3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim, BB, NACE	L21KA1DT9
Globe	309, 307	3/4 – 1-1/2	Class 800	THRD	CS body, API #12 trim, BELLOW SEAL,WB, NACE	L21KAOJTL9
Globe	309, 307	3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim, BELLOW SEAL,WB, NACE	L21KA1JTL9
Globe	307	2 - 3	Class 150	RF	CS body, API #12 trim, BB, NACE	L21BA3DT9
Globe	307	4 - 8	Class 150	RF	CS body, API #12 trim, BB, GO, NACE	L21BA3DTB9
Check	61, 328	3/4 – 1-1/2	Class 800	SW	CS body, API #12 trim, Piston, BC, HORIZ.	L22KA1TTF9
Check	62, 328	2 – 24	Class 150	RF	CS body, API #12 trim, BC, Swing, NACE	L22BA3PT9
Ball	26, 101	2 – 12	Class 150	RF	CS, (A216-WCB) T7 MOD, RP, ORBIT, NACE	L25BB3FF9
Butterfly	101	2 – 24	Class 150	RF	CS body, 316 SS trim, Flg, Triple Offset GO, NACE	L26BA3TJM9
FLANGES	02, 104					
Socket Weld		3/4 – 1-1/2	Class 150	RF	CS, ASTM A105, ASME B16.5, 160	L40BA3BL
Socket Weld	12	3/4 – 1-1/2	Class 300	RF	CS, ASTM A105, ASME B16.5, 160	L40FA3BL
Blind		3/4 – 24	Class 150	RF	CS, ASTM A105, ASME B16.5	L43BA3
Blind Spectacle		3/4 – 18	Class 150	RF	CS, ASTM A516-70, ASME B16.48	L45BA3E
Spacer Ring		20 – 24	Class 150	RF	CS, ASTM A516-70, ASME B16.48	L45BA3F
Blind Plate		20 – 24	Class 150	RF	CS, ASTM A516-70, ASME B16.48	L45BA3G
Weld Neck		2 – 2	Class 150	RF	CS, ASTM A105, ASME B16.5, XS/80 Bore	L40BA3DN
Weld Neck	12	2 – 2	Class 300	RF	CS, ASTM A105, ASME B16.5, XS/80 Bore	L40FA3DN
Weld Neck		3 – 24	Class 150	RF	CS, ASTM A105, ASME B16.5, STD Bore	L40BA3DM
Weld Neck	12	3 – 24	Class 300	RF	CS, ASTM A105, ASME B16.5, STD Bore	L40FA3DM
Weld Neck	203	26 - 28	Class 150	RF	CS, ASTM A105, ASME B16.47"B", STD Bore	L48BA3DM
Weld Neck	203	30 - 42	Class 150	RF	CS, ASTM A105, ASME B16.47"B", XS Bore	L48BA3DN
Pair WN Orifice		1 – 1-1/2	Class 300	RF	CS, ASTM A105, ASME B16.36, NPS ½ SW taps, 160 Bore	L42FA3DLL
Pair WN Orifice		2 – 2	Class 300	RF	CS, ASTM A105, ASME B16.36, NPS ½ SW taps, 80/XS Bore	L42FA3DNL
Pair WN Orifice	17	3 – 18	Class 300	RF	CS, ASTM A105, ASME B16.36, NPS ½ SW taps, Std Bore	L42FA3DML
GASKETS						
		3/4 – 24	Class 150		Spiral wound type 316L SS w/ flexible Inhibited Graphite filler, ASME B16.20, w/inner ring.	L61BF1CAC
	301	3/4 – 24	Class 150		KAM style, 316L SS w/APX-2 Graphite, EXH-SU-5151	L61BF1ZA
	12	3/4 – 24	Class 300		Spiral wound type 316L SS w/ flexible Inhibited Graphite filler, ASME B16.20, w/inner ring.	L61FF1CAC
	12, 301	3/4 – 24	Class 300		KAM style, 316L SS w/APX-2 Graphite, EXH-SU-5151	L61FF1ZA
	203	28 - 42	Class 150		Spiral wound type 316L SS w/ flexible Inhibited Graphite filler, ASME B16.20, w/inner ring.	L61BF1CAC
BOLTING						
Stud Bolts		3/4 – 42			ASTM A193, Gr B7 stud w/ 2 heavy hex nuts ASTM A194, Gr 2H	L620BM

90° BRANCH CONNECTION, Legend and Chart

BRANCH	HEADER SIZE																					
	42	38	36	34	32	30	28	24	20	18	16	14	12	10	8	6	4	3	2	1-1/2	1	3/4
42	T																					
38	E	T																				
36	E	E	T																			
34	E	E	E	T																		
32	E	E	E	E	T																	
30	E	E	E	E	E	T																
28	E	E	E	E	E	E	T															
24	E	E	E	E	E	E	E	T														
20	E	E	E	E	E	E	E	E	T													
18	P	E	E	E	E	E	E	E	E	T												
16	P	P	E	E	E	E	E	E	E	E	T											
14	P	P	P	P	E	E	E	E	E	E	E	T										
12	P	P	P	P	P	P	E	E	E	E	E	E	T									
10	P	P	P	P	P	P	P	E	E	E	E	E	E	T								
8	W	W	W	W	W	W	W	W	E	E	E	E	E	E	T							
6	W	W	W	W	W	W	W	W	W	E	E	E	E	E	E	T						
4	W	W	W	W	W	W	W	W	W	W	W	W	W	E	E	E	T					
3	W	W	W	W	W	W	W	W	W	W	W	W	W	W	E	E	E	T				
2	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	E	E	T			
1-1/2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T		
1	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	T	
3/4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	E	T

E Reducing Tee
P Branch Weld w/ Reinforcing Pad (Pad thickness equals run pipe thickness. Pad width equals 1/2 branch OD.)
T Equal Tee
S Sockolet
W Weldolet (Note 05)

NOTES:

03 THREADED JOINTS ARE PERMITTED ONLY AT OUTLET OF VENT AND DRAIN VALVES,AT HYDROSTATIC CONNECTIONS, AT OUTLET OF INSTRUMENT TAKE-OFF VALVES, AND TO MATCH EQUIP.
05 INTEGRALLY REINFORCED BRANCH CONNECTIONS ARE PERMITTED OUTSIDE THE SIZES SHOWN IN THE BRANCH CONNECTION TABLE. DESIGNER SHALL CHECK WELD THICKNESS OF INTEGRALLY REINFORCED BRANCH CONNECTIONS TO DETERMINE IF PWHT IS REQUIRED.
06 THESE VALVES SHALL BE USED ONLY FOR VENT, DRAIN, AND INSTRUMENT CONNECTIONS.
12 TO BE USED ONLY TO MATCH CLASS 300 RATED FLANGE CONNECTIONS AT CONTROL VALVES AND SPECIAL EQUIPMENT.
15 TO BE USED WHEN MATING TO FLANGED NOZZLES.
19 SCH 160 PIPE AND PIPE NIPPLES SHALL BE USED FOR THREADED CONNECTIONS FOR NPS 1/2 - 1-1/2.
26 TO BE USED ONLY WHEN INDICATED ON P&ID.
61 INSTALL IN HORIZONTAL POSITION WITH COVER UP.
62 INSTALL IN HORIZONTAL POSITION WITH COVER UP OR IN VERTICAL POSITION WITH UPWARD FLOW.
301 FOR USE IN VOC REGULATED SERVICES; IN FLANGES WITH SLIGHTLY DAMAGED GASKET SEATING FACES; OR IN FLANGES WITH A HISTORY OF LEAKING.
307 LIMITED TO THROTTLING SERVICES UP TO 150 PSI DIFFERENTIAL PRESSURE. FOR SERVICE APPLICATIONS WITH DIFFERENTIAL PRESSURES GREATER THAN 150 PSI, CONSULT WITH THE VALVE MANUFACTURER AND CHEVRON PIPING & VALVE SME FOR SUITABILITY.
325 USE FULL PORT VALVES IN LOCATIONS REQUIRING FULL OPENINGS SUCH AS UPSTREAM AND DOWNSTREAM OF RELIEF VALVES OR IN HORIZONTAL LINES CONTAINING HAZARDOUS LIQUIDS.
328 SIZING AND LOCATION OF CHECK VALVES IS CRITICAL FOR RELIABLE OPERATION. SEE SECTION 6.0 (25) IN THE GENERAL SPECIFICATION FOR MORE INFORMATION.
329 IN GENERAL, KNIFE GATE VALVES ARE TO BE RESTRICTED TO LARGE DIAMETER, LOW PRESSURE, LOW TEMPERATURE SERVICES SUCH AS RELIEF AND FLARE HEADERS.
17 USE WELD NECK FLANGE AND THROAT TAPS NPS 20" AND LARGER
91 USE RESTRICTED TO DRAINS, OPERATIONAL VENTS, AND INSTRUMENT ASSEMBLIES ONLY. THREADED NIPPLES TO BE SEAL WELDED. NIPPLE LENGTHS SHALL BE IN ACCORDANCE WITH STANDARD DRAWING GD-L-1057
92 USE RESTRICTED TO THERMOWELL ASSEMBLY ONLY
101 TO BE USED WHERE TIGHT SHUT-OFF IS REQUIRED.
104 USE CLASS 300 FLANGES WHEN MATING TO CONTROL VALVES AND EQUIPMENTS
309 USE BELLOW SEAL GATE VALVES FOR ALL IN-KIND PEPLACEMENT ONLY. INSTALL NEW BELLOW SEALVALVES WHEN REQUIRED BY PROJECT FOR PERMIT PURPOSES.
203 FLANGES AND GASKETS SHALL CONFORM TO ASME B16.47 SERIES B.

SERVICE:

- Hydrocarbon Gas, Vapor, Liquid w/ Moderate H2S (USE TO MATCH TO EXISTING PIPING; CLASS 300 RECOMMENDED FOR NEW SYSTEMS)
- Sour Process Gas (USE TO MATCH TO EXISTING PIPING; CLASS 300 RECOMMENDED FOR NEW SYSTEMS)
- Flare Gas w/ H2S
- Rich & Lean DEA (<100 °F)
- Sour Service (NACE) (USE TO MATCH TO EXISTING PIPING; CLASS 300 RECOMMENDED FOR NEW SYSTEMS)

Self-Cured Inorganic Zinc | Polyamide Epoxy (High Build) | Aliphatic Polyurethane — 3.1

Surface Prep: SSPC-SP6 (NACE No. 3) Commercial blast finish.

Anchor Pattern: 1.5 - 2.5 mils

Total DFT: 9.0 mils (min)

Touch Up: Coating System (CS) 3.5. After applying the tie-coat: (Repair any damage exposing bare metal with CS 3.5. Repair any damage to the inorganic zinc primer, as necessary, with CS 3.5 to maintain specified film thickness.).

Coat, Generic Classification, DFT	Manufacturer	Product Designation	VOC (G/L)	By Max Svc Temp
PRIMER	Ameron	Dimetcote 9	491	
	Ameron	Dimetcote 9HS	323	
Self-Cured Inorganic Zinc - Solvent Reducible	Carboline	Carbozinc 11	515	
	Carboline	Carbozinc 11 HS	264	
	Devoe	Catha-Coat 304V	336	
2.0 - 3.0 mils DFT	Hempel Coatings (USA), Inc.	Galvosil 1568	320	
	Hempel Coatings (USA), Inc.	Galvosil 1578	520	
	International	Interzinc 22	490	
	International	Interzinc 22HS	340	
	Jotun Paints	Resist 78	465	
	PPG Industries	Metalhide 1001 Primer 97-673/97-674	397	
	Sherwin Williams	Zinc Clad II B69V3/B69D11	462	
	Sherwin Williams	Zinc Clad II HS B69VZ1/B69VZ3/B69D11	312	
	Sigma Coatings	SigmaZinc 158	507	
	Keep inorganic zinc silicate mixed, using agitated pot while applying.			
TIECOAT	Ameron	Amercoat 385	276	
Epoxy - Polyamide	Carboline	Carboguard 893	195	
	Devoe	Devran 224HS	212	
High Build	Hempel Coatings (USA), Inc.	Hempadur 4520	400	
5.0 - 7.0 mils DFT	Hempel Coatings (USA), Inc.	Hempadur 45880	215	
	International	Intergard 475 HS	175	
	Jotun Paints	Penguard Tiecoat 100	480	
	PPG Industries	97-148	0	
	Sherwin Williams	Macropoxy 646 B58-600 Series/B68V600	235	
	Sigma Coatings	SigmaCover 435	344	
TOPCOAT	Ameron	Amercoat 450 Series	335	
Polyurethane - Aliphatic	Carboline	Carbothane 134 HG	288	
	Devoe	Devthane 379	311	
	Hempel Coatings (USA), Inc.	5595U	312	
2.0 - 3.0 mils DFT	Hempel Coatings (USA), Inc.	Hempathane 5595	332	
	International	Interthane 990	395	
	International	Interthane 990HS	332	
	Jotun Paints	Hardtop HB	256	
	PPG Industries	95-8512	0	
	Sherwin Williams	Hi-Solids Polyurethane B65-300 SeriesB65/	289	
	Sigma Coatings	Sigmadur 500 US	320	
	Respirators are strongly recommended when applying polyurethane.			

Volatile Organic Compound (VOC) limit may vary by location. Check local standards for current VOC limits. Consult manufacturer's product data sheets for specific details about applying any coating.